



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

THE PHILOSOPHICAL REVIEW.

PERCEPTION AND PHYSICAL REALITY.

THE recent appearance of vigorous criticisms of epistemological 'idealism,' and of equally vigorous affirmations of 'realism' regarded as the antithesis of this form of idealism, may be taken as evidence that the fundamental epistemological problem of the relation of cognizing mind to physical reality is still a battle ground of philosophical discussion. I propose, therefore, in the present article to reëxamine this problem from the standpoint of perception, since I conceive that it is in perception that the crux of the problem is to be found. In this undertaking I shall eschew as much as possible the use of those very misleading and confusing terms 'idealism' and 'realism.' It may conduce to clearness, however, to say, at the outset, that epistemologically my theory is realistic, and it involves a metaphysical view which may be called 'organic experientialism.' Perhaps the closest point of contact of the present paper with recent discussions is with the very striking paper read by Professor A. E. Taylor at the Ithaca meeting of the American Philosophical Association, December, 1907, and briefly reported in the proceedings of the association in the *PHILOSOPHICAL REVIEW*, Vol. XVII, pp. 173-5. I regret that this paper has not yet been published in full. As I remember it, Professor Taylor argued that perceptions are the realities of the external world. It will be one chief aim of the present article to establish this view, and another to draw out its implications. For the sake of simplicity and directness I shall ignore the distinct problem as to how we know other finite minds, except in so far as the discussion of this problem is connected with our main issue, — the relation of perception as cognitive act to physical reality. This issue is best handled, I believe, by a direct analysis of experience.

There are several errors that stand in the way of a true theory of perceptual experience. Some of these have only historical interest now, but it is perhaps better to enumerate and consider them all.

The first of these is an error that lay at the roots of modern philosophy's subjectivism in its first period, — in Locke, and his followers, and in Cartesianism as well. I mean the sharp separation of the primary and secondary qualities of objects, and the affirmation that the former alone have objective cognitive value. The source of this error was the uncritical acceptance of an abstraction or distinction, very convenient in physical science with its quantitative aims, but without justification when dogmatically adopted into epistemology. The so-called primary qualities, — extension and movement in space, impenetrability and inertia or resistance to movement, etc., in short, the space-time-mass properties of the physical world, are of primary importance for the purposes of numerical precision in the analytical description of bodies by mathematical instrumentality, since these properties represent cognitively the most constant and continuous of our sensations. By reason of their easier describability and calculableness they have afforded, too, through the ages of man's technological struggle with nature, an approximately permanent basis of operation for the practical and social activities of mind upon the material substructure of things. On the other hand, such sensible qualities as tones, tastes, colors, heat, and cold, vary much more both with reference to the sentient subject and the physical processes. These qualities are of secondary value from the standpoint of the physicist's purpose to weigh and measure things. A distinction which has a purely instrumental and teleological value within a limited realm of thought's operations should not be allowed to become a determining category for an investigation concerned with the relation of thinking mind and world in their respective totalities. Now, we have, of course, outlived in philosophy this error, which infected both Lockeanism and Cartesianism. We all, I suppose, recognize that the so-called primary qualities of things are on the same epistemological footing as the secondary qualities: that if one set is subjective, all are

subjective, and, if all are subjective, and the objective reality of the physical is merely that of a non-qualitative spatial substance, the real physical world, thus stripped of all the determinate qualities of sensible experience, is but a hypothetical concept, an unknown and unknowable X, whose relations to the actual properties of perceived objects are inconceivable.

Although philosophy has, in general, outgrown this error, one still finds, it seems to me, the shadow of it hovering over such protests in behalf of a more robust scientific realism as those of Professor Woodbridge, when he says, for example, that scientists attempt to discover the constitution of the ether, the weight of atoms, their structure and their relations to each other,¹ and that "the problem of the continuity and homogeneity of the perceived world with the processes which give rise to it appears to be a problem lying wholly within the domain of positive knowledge."² If all this means that the specific and unique relation to the experiencing subject is to be counted out of the data of the epistemological problem at the very outset, then I think Professor Woodbridge sets a problem that can be fruitfully investigated by no sort of knowing process, positive or otherwise.

The physicist may go ahead and forge his fictive entities and symbols, without pausing to consider critically the epistemological situation, so long as he does not dogmatize and substitute hypothetical entity for sensible reality, but when he tells us, for example, that the ether "is as essential to us as the air we breathe,"³ he needs to be reminded that the hypothetical essentiality of his ether to the coherence of an elaborate symbolic schema, for certain purposes abstracted from the concrete organism of experience, is very different from the essentiality of persistent features of that concrete experience when taken in its totality. If one step in physical analysis and reconstruction necessitates another, this other step is properly regarded as essential; but the whole could be taken as real only if the physicist could show

¹ "Perception and Epistemology," in *Essays Philosophical and Psychological in Honor of William James*, p. 151.

² *Ibid.*, p. 163.

³ Sir Joseph J. Thomson, *Science*, Aug. 27, 1909, presidential address, British Association for the Advancement of Science, Winnipeg meeting, 1909.

that, in his very first step, he took with him the concrete and qualitative variety of experience. This, I opine, he cannot do. Hence, notwithstanding additional evidence for the reality of ether and electric corpuscles, these things are still hypothetical instruments, not constituents of experienced reality. The physicist's ions, electrons, and ethers, are manipulations of primary qualities taken in 'abstraction.' They are symbolic constructions of the space-time-mass order, whose function is to summarize the analysis thus far of aspects of actual experience, and to point the way to new experiences, by serving as handy instruments for the intellectual manipulation of masses of facts and the suggestion of new experiments. If atoms and ether should become matters of sensible experience, they would thereby cease to be the atoms and ether of present physical theory. Their characters would be altered, since, as sensible realities, they would take on various other sensible qualities than those of the abstract space-mass-time-number order. They would cease to be regarded as mechanical causes of experience. For instance, if in themselves colored and glowing, electrical corpuscles would no longer be strictly mechanical 'causes' of color and light. To ascribe to these entities, in their present form, independent self-existent reality, as causes of perception, or as the real things behind material phenomena, is simply to reinstate, in a more elaborate form, the doctrine of the exclusive objectivity of the primary qualities.¹ When atoms and ether have become sensible realities they will have ceased, by virtue of their qualitative discontinuities and concrete variety, to serve the mathematical phys-

¹ I confess to a considerable difficulty in making out, when reading such works as the address of Sir Joseph Thomson already referred to, just what 'matter' is supposed to be, and what its actual relations may be to the ether. Professor Thomson thinks matter is full of holes and these holes are filled up with ether; but this also permeates matter and is probably discrete in structure. If so, I suppose the elementary particles must be connected by dynamic relations, and these relations perhaps require another ether as their medium. Being, in this matter, a befogged layman I am glad to be able to refer to an illuminating article by Professor Louis T. More in the *Hibbert Journal*, Vol. VII, No. 4. Metaphysics, quiescent among philosophers, seems to be rampant in the new physics. Professor H. E. Armstrong in the opening address before the chemical section of the British Association, Winnipeg, 1909, points out, among other criticisms of current physical speculation, that the element in chemistry is but an ideal term, a mere conception. *Nature*, Sept. 2, 1909.

icist's need of mechanical models and quantitatively continuous symbols, and, as elements in the system of experience, will have taken on a teleologically significant character. Until that happy day dawns, they remain limiting terms in an ideal quantitative analysis of the most highly generalized aspects of physical experience.

The primary and fundamental reality of the physical order is the realm of perceptual experience. Either the concrete sensible qualities of perception are, in all their complex and variegated sensation, adequate and primary psychical exponents of the real outer world, and the physically objective is to be rightly apprehended and conceived only as inclusive of the experiencing subject's perceptions, or else the real physical order is an unknowable X, lying somewhere and somehow behind the primary qualities of objects, and represented in human knowledge only by a set of imaginative constructions and symbolic formulas that show no intelligible continuity of the so-called 'real' physical order with the qualitative complexity of actual and concrete experience.

A second chief error in both Locke's and Descartes's accounts of knowledge, and one which is directly involved in and grows out of the first error, is the subjectivistic assumption that the external world is known by us, not immediately and directly as it is in itself, but through the intervening machinery of 'ideas,' which are thus regarded as a middle kingdom mediating between the mental realm and the real physical realm of mass, motion, impenetrability, etc.¹ I need not point out how this error led to great labor on the part of Locke to bridge the chasm by showing how things get into the mind in the form of ideas, how Locke's base of operation dissolved through Hume's ruthless consistency into a sceptical flux of impressions, or how Descartes, starting from the other end, *i. e.*, the immediate certainty of self-consciousness, tried to show how the mind could, by a *salto mortale* of faith, in the shape of the belief in the veracity of God who implants correct ideas in the mind, get into reliable touch with the world. I need not take much space to point out that this

¹ The true relationships of mediacy and immediacy in knowledge are clearly stated by Professor G. F. Stout in his article, "Immediacy, Mediacy and Coherence," *Mind*, Vol. XVII, pp. 20-47.

error is the fruitful mother of solipsistic theories, and, more especially, of a subjective idealism, in which 'idea' means something totally different from what it means in the objective teleological idealism of Plato, Aristotle, and Hegel. It were greatly to be desired that, in current controversy, one should state what one means by idealism, and that it should be clearly recognized on all sides that a clear-sighted and consistent philosophy of knowledge must start from the principle that in perception the mind is in immediate commerce with the real physical world, whatever may be the possible further interpretations of this world.

The psychological sources of the view that knowledge of the world is mediated by sensations and ideas that belong primarily to the subject, or hover between subject and object, and stand in an entirely problematical relation to the latter, are to be found, of course, in the recognition, through the birth of an introspective self-consciousness, of the difference between memory images and 'ideas' of things as present in the mind when the corresponding things are not actually being perceived, in the discovery of the fallibility and variability of perceptions and images and of the persistent illusions of the senses, and, further, in the rise of a science of physics which attains certainty of procedure and precision of result by the geometrical treatment of the so-called primary qualities in abstraction from the troublesome flux of secondary qualities.

It is hardly necessary here and now to elaborate the principle that, neither genetically nor logically, is knowledge of the self's inner processes prior to knowledge of the external world. These two aspects of experience develop together in mutual dependence, and the one cannot be defined without reference to the other.¹ In perception the mind is always in some immediate relation with the world. We do not see first our own visual sensations, hear first our own auditory sensations, etc.; and, then, through the medium of these sensations, perceive actual things. If our experience began by being simply inner self-experience, there would be no logical way of getting beyond the closed circle of one's

¹ Professor G. Dawes Hicks has lately traced the parallel development of the relation of subject and object. *Proceedings of the Aristotelian Society*, New Series, Volume VIII.

private consciousness. In perception things with their qualities are given and received, by the intercourse of mind and world. Looked at from the subject side perception is a receptive act of consciousness. Perceptually, consciousness is what it is just in this immediate act of communion with objects. To perceive is an irreducible 'note' of consciousness. Looked at from the object side perception is the regular determining condition, point of reference, or end-term of the subject's act of communion with a world that is not-this-cognizing self. Object and subject are mutually implicated poles of actual experience. The latter is a significant totality with these dual aspects. And, of course, we cannot draw any sharp dividing line in experience between the perceptually given and the conceptually organized. These are continuous in actual experience. Perceptual experience is never anything meaningful, if it be taken to exist apart from thought's organizing activity. Immediate experience is mediated, as knowledge of a world, not by 'ideas' but by judgmental activity, exercised in apprehending and comprehending. The crudest perception involves thinking,—involves comparison and unification, the thought-activity that, in logical terms, we designate as the determination of identity-in-difference. The relationships of sense-qualities,—likeness and unlikeness, concurrence in time, degrees of intensity, etc.,—must be true both *in* the things and *for* the mind which apprehends the things.

Since the mind knows things without the intervention of 'ideas,' the assumption of an independent realm of things and energies existing apart from all percipient experience is both superfluous and unmeaning. Berkeley, starting from Locke's doctrine of ideas, took the bold step of affirming that these ideas, and not an abstract matter, were the realities of perception. He was right in his criticism of matter; but, in his attempt to supply an objective basis for perception by the theory that all content of perception is at once effect of a mind and cause of an idea in another mind, Berkeley went beyond what is warranted by an analysis of perceptual cognition. It does not follow that, because perceptions are physical realities, perceptions are necessarily caused directly by one mind in another mind.

Indeed, and this is the third erroneous view that I wish to dispose of, it is confusing and misleading to assume that the cognitive relation of mind to physical reality must be conceived in causal terms at all, whether the cause be designated movements of mass particles, spirits, or God. This is not the place to attempt a critique of causality.¹ I will content myself with endeavoring to show that, while the physical reality of things is perceptual, perception is not 'caused' in the mind, and that the real object is perception as a significant element in the subject-object system of experience. Indeed, if one were to insist on discussing this relation in causative terms, it would be quite as much to the point, for example, to say that sensations of red and blue and green are causes of ether vibrations of certain rates of speed as to say the reverse. For the sensations or sense-perceptions are the *ratio concipiendi* of the ether vibrations, and it is certainly begging the question to maintain that the experienced actuality which is the *ratio concipiendi* of a hypothetical something has its *ratio essendi* in this fictive entity.

A causal explanation, to be scientific in character, must include two elements: (1) The thing to be causally explained is invariable consequent and the explanatory thing is invariable antecedent; and (2) there is an identity of quantitative relation between cause and effect. Neither of these elements, it seems to me, can be shown to hold true in the situation we are discussing. It cannot be shown either that the actual perception is temporally consequent upon, or quantitatively equivalent to, a non-perceivable entity, either material or psychical.

If one insist upon maintaining that an account of perception of the physical order in terms of non-perceptual causal antecedents is the sole scientific and sufficient theory of perception, one must meet the following difficulties: (1) Suppose that any given perception is the product of mechanical causes, say of the motions of mass-particles or undulations in a continuous physical medium, impinging upon nerve endings. Then we have an effect that is both incommensurable with its causes, and, from a physical standpoint, superfluous. Not only is the qualitative change from

¹ I hope, in another article, to return to the discussion of causality.

cause to effect, from undulatory motion to color, for example, inconceivable; from the standpoint of quantitative mechanical science it is a miracle, an unaccountable and perplexing by-product of the real machinery of things. There is no place at all for the so-called effect called 'perception' in the quantitative continuity of the physical series, which consists 'in itself' of transformations of 'matter' and 'energy.' The principle of the conservation of energy, if it be taken as a dogmatic metaphysical principle, does not leave any room in the real causal series for psychical activity. (2) The cognition in question may be explained as the joint effect of three causes, physical process, physiological process, and mental reaction. Then, since a perception is not a material constant or quantity, and, since a mental reaction cannot be measured in terms of mechanical force or work, we can sum neither the totality of the effects nor the totality of the causes. Consequently, we cannot determine what part each so-called cause contributes to the result, or what is the relation of the total effect, say the perception of the desk, to the real physical non-perceived things or movements, regarded as causes contributory to the perception. In fine, if the perception itself be not the primary real thing, we cannot determine by a causal analysis of its antecedents to what extent we know the real thing. And, if the perception be the real thing, the non-perceived motions in external space and in the human body, however interesting and useful they may be as hypothetical entities for certain limited purposes of science, have no central function in the interpretation of the epistemological relation of percipient and perceived object. The physical process, as residual phenomenon reached by elimination of the mental reaction, is truly 'phenomenal' and no independent reality.¹

Causal conceptions have a loose signification in popular usage, which makes no clear distinction between mechanical cause and

¹ I am not concerned here with the place of the science of psycho-physics, or how far its results may be either true or useful. I am concerned to maintain, as against the imperialistic claims of causal explanation, that a non-causal interpretation of experience is not only a real business, but, as well entitled to be called scientific. Those who deny this claim may be invited to explain in terms of mechanical science *how* one mental process causes another and how a non-perceptible process becomes an experience.

purpose or end. Causal conceptions in physical science have definite and useful functions. The introduction of either type of causation, uncriticised, into the interpretation of the relation between cognizing mind and physical object, a relationship which is fundamental to all experience, is productive of confusion and error. The true starting-point of epistemology, a starting-point that lies at once behind and beyond all special popular or scientific points of view, is a direct and unencumbered analysis and re-synthesis of that concrete whole of experience which bifurcates into the physical and the psychical, but is never exclusively either the one or the other. The concrete whole is a significant and teleological system of experience, inexplicable in causal terms. Physical reality, then, is the realm of actual and possible sense perceptions. The concretely physical is just that which yields and sustains perceptual experiences. Not only the primary qualities of space, time, mass, and movement, with their quantitative ideality' shown in their subserviency to the human purposes of enumeration, and measurement, but, as well, the thronging and incalculable diversity of colors, sounds, smells, heat, and cold, etc., are, as elements in the organic and significant whole of experience, objectively real. All the qualities of perceptual experience are elements in the objective order. Since you and I are functioning centers in this order what we perceive is real. Epistemologically, the 'objective' should mean the public, communicable, and shareable aspects of experience; 'subjective' should mean simply the private, incommunicable, and unshareable aspects of experience. In terms of this distinction, 'feeling' is private and unshareable in its immediate reality; illusions are subjective, since they are not publicly verifiable experiences. It may be objected that the plausibility of this theory is due to the confusion of perception, as psychical process, with the objects to which that process refers. It may be urged that such a theory logically involves the doctrine that our psychical states have all the qualities of the perceived objects. Must I not, then, admit that my mind in perceiving a rosebush in bloom, is extended, massive, colored red and green, smells sweet, etc.? I reply that, in the first place, the individual mental aspect of actual perception is not

a psychical state at all.¹ Perception, considered as a mental process is an *activity*. To perceive is to act, to make a judgment. In this act the mind enters into a fundamental and irreducible relationship. It is not necessary to this act that the rosebush should be literally 'in' my mind, in the sense in which I apprehend it actually to exist in the garden. The actual system of space relationships does not admit of my mind being in the garden and the garden being in my mind in the same sense. In the act of perception the individual mind is an apprehending center for the relations of objects to one another and to itself. This function of factual judgment is simply an ultimate quality of mind as we know it.

Perceptive consciousness is not a relation, but a center of relating activities. It is simply the nature of mind as a functioning center of illumination in a world that is lighted up at certain points to apprehend what is 'other' in character than itself. My perception of green leaves is not a green and leafy perception. For a green and leafy mental state could not, as such, be distinguished from a green and leafy object, if the greenness and leafiness in object and mental act were wholly identical. The act of perception, then, is not green as the object perceived is green. The perception of greenness is an act of conscious relating that arises at certain focal points or centers in the system of experience in which this system becomes aware of itself. The becoming aware is just as essential to the reality of experience as are the objects of awareness. And, on the other hand, the mind, in so far as it is identical with the judgmental act in perception, is just an activity qualified and constituted by the perceptual relationship. While the sense qualities of physical things are not literally attributes of the mind, in the sense in which they are attributes of the external space world of things, the mind is what it is only in relation to these sense qualities. Mind is a power which operates by perceiving and conceiving qualities that are 'other' than itself as a perceiving and conceiving center. In its own unity and activity the mind may, perhaps, be better described

¹ Whether, and, if so, in what sense, a psychologist is justified in talking about mental 'states' is, of course, another matter.

as inextended, uncolored, devoid of smell and temperature. But, certainly, the capacity and the fact of entering into the perceptual relationships connoted by these terms is an essential characteristic of mind. A Cartesian contrast of mind, as absolutely and simply inextended thought, with body, as extension, is just as false and misleading as a crude materialism. Mind is a *trans-spatial*, not a *non-spatial*, active center of relationships. There is surely a meaning in saying, by way of metaphor, that my mind spreads itself over the landscape that I enjoy, and sinks itself in the beauties thereof, without asserting that my mind is forty square miles in extent or is subject to gravitational acceleration. Mind comes to consciousness, and is an illuminating center of experience, through its function of entering into relationships with what is 'other' than itself, namely, an external order, of knowing itself therein, and thus coming to itself as an irradiating center of relationships in the organic whole of experience. Reality is to be found either in the organic and systematic whole of percipients and perceived objects or nowhere. Subject and object are the constant reciprocals in a teleological system, — not juxtaposed bits in a mechanical causal complex. Emphasis may fall, now on the inner and private, now on the outer and public aspects of this experience ; but neither element has final and full reality apart from the other. These elements of the world are real only in their interrelatedness.

Physical reality, then, is the complex content of actual and possible perceptual experience. And 'possible' perceptual experience is conceivable and definable only in terms of its immanent logical continuity with actual experience. It is the system of experience which is real.

This view, although reached by a somewhat different road, that affects the precise character of the goal, is, of course, akin to that held by many philosophers to-day. It can perhaps be best developed further in the light of a number of possible objections.

I will consider first, two that are closely connected : (1) the objection from the apparent time element of actual perception ; and (2) the objection that our theory denies the reality of past pre-

sentient or pre-perceptual phases of the earth's history, and of the history of the solar system before organized and conscious life was possible therein.

An example to illustrate the first objection is the perception by me now in the night sky, at a specific instant of time, of a star so distant that the stellar light which I see at this instant must have radiated from the star some thousands of years ago. I say I see the star now, but perhaps, the astronomer tells me that the light must have started from the star in the days of Hammurabi of Babylon. Certainly, it will be said, the existence of this star, which I see now, but which, as I now actually seem to see it, really existed then did not then depend on Hammurabi's perceiving it, and cannot now depend on my perceiving it, or, indeed, on its being perceived by any other mind, whether of human being or angel. What sense is there, then, in asserting that the star is real only as an object of actual and possible experience?

Of a truth, my recognition, or anybody's recognition, of the star as a physical reality involves the admission that the star exists independently of our perceiving it, but not that it thus exists otherwise than as a possible object of perception. What I now actually perceive is the twinkling light of a star. This actual immediate perception by me, or the record of it by some other percipient, is the firm base and starting-point for whatever theories, of how the star may be perceived, in what lapse of time, and at what distance, may be constructed by the astronomers. The theory that light radiates through vast interstellar spaces in calculable times is a conceptual interpolation in actual experience, a conceptual expansion of actual experience into imaginable possible experience. The time which is supposed to have lapsed in the case in point is not an actually experienced time, but a possible, experienceable, time. The luminiferous ether, the mathematical calculations, the telescopic observations, are all instruments for the imaginative and coherent extension of possible experience by which we expand into cosmic percipients. This whole edifice of a possible experience is built on what is actually perceived.

The case of pre-sentient phases of the world's history does

not differ in principle from that just discussed. We admit the probable, or, at least, possible truth of the geologist's and astronomer's account of the histories of earth and solar system. These are all, however, conceptual constructions, coherent imaginative structures, chosen from an indefinite variety of possible accounts of the world's past. And why are precisely these accounts chosen? Just because they are most coherent with the contents of actual perceptual experience. It is from present perceptual experience of rock strata, fossils of plants and animals, organic and inorganic processes, nebulae observed in the interstellar spaces, etc., that these constructions of a past are made. These are continuous with present perceptual experience, and their explanatory value is determined by their coherence and continuity therewith. Whatever account of the world's past history may be the truest, its truth is that of a retrospective projection, from and congruent with actual experience. And the meanings of these retrospective projections consist in their functions as conceptual frameworks and plans of possible experiences, coherent with actual experiences. The time that may be allowed for this history to have occurred is an interpolation between present observable processes in nature and the perceived remains of processes that have ceased.

'But surely,' one hears it said, 'you do not seriously intend to assert that there would have been no cosmic nebulae or planetesimals, no cooling globe with its grinding and upheaval and contortion of rocks, no crash and glare of world-forming energies, where life and sentience could not, for an instant, have endured, without percipients?' 'What rank folly, to assert that cosmic forces must have been perceived or non-existent?'

Such questions arise from a misunderstanding and an oversight. The misunderstanding is this,—that the assertion of the unescapable mutual involution of reality and experience requires the assumption that finite percipients of the human type must have been seeing and hearing the cosmical machinery at work, if our theory is true. What is actually required by the theory herein advanced is that, since the actual world is in its totality an organic and significant whole, of which perception is a per-

sistent and primary function, some type of perceptual or experiencing process is continuously involved in the total being of a universe with which the actual fragment of a universe that we experience, however episodically, is continuous and congruent. Concerning any other sort of universe I do not know what could be intelligibly said. On the other hand, there is doubtless little that can be said positively as to the specific character of cosmic perception in its prehuman, subhuman, or superhuman phases.

The oversight in question lies in forgetting, after one has started to enlarge one's pin-point of actual experience outwards in space and backwards in time, that one's conceptual scheme of a more comprehensive reality, however imposing it may be, is, after all, an imaginative construction of a realm of possible experience that roots in and logically grows out of the realm of actual experience.

Launch your thought out to the remotest star, or retrospectively project it backwards in time to the earliest conceivable point of cosmical evolution, the thought has sense and significance, factual coerciveness and logical coherence, simply because it starts its flight from an analysis of actual concrete experience and is sustained by logical forms of synthesis that are developed in the coherent organization of such experience.

The dual world of perceived qualities and percipients remains the primary reality. Eliminate either factor in your construction of a universe and the organic continuity of reality is broken. A 'real' that is in itself neither experienced or experienceable, *i. e.*, coherent with experience, is a real concerning which no intelligible statement can be made. In the organic whole of experience the living unity in duality of experient beings and experienced qualities must be a persistent feature. If physical reality be primarily the perceptual realm, how, since actual experience always appertains to some individual experient, is the distinction to be drawn between the subjective or private and the objective or public phases of experience? Can our theory really escape the consequences of subjectivism? The ordinary psychological criteria of objectivity, drawn as these are from an inspection of the immediate qualities of experience in and for the indi-

vidual center of experience, do not suffice logically to establish objectivity, or to account wholly for the plain man's belief in a common physical reality independent of his own intermittent perceptions. The belief in the continued existence of things between successive intervals of my perception of them as the same, may be, as Hume said, a fiction of the mind. The independence in the order of my perceptions, of my desires and plans, by contrast with the dependence of my images, 'ideas,' plans, etc., on feeling and purpose, is only a partial independence and may be due to the formation of purely habitual series of mental associations between elements of my experience whose linkages escape introspective analysis. The mere routine order of experience is no final proof of objectivity. The "superior force and liveliness of present impressions," which seems the clearest and surest mark of distinction between the perception of actual objects and mere images and ideas, may also appertain to illusions and hallucinations. Moreover, this test fails to account for the absence of confusion between a weak perception and a strong image. There is no reliable individual psychological criterion of objectivity, nor any basis for its discussion, if one begins by ruling out the immediacy of relation between percipient and perceived object. If, on the other hand, one admit this immediacy, a working criterion of objectivity is the coherence, in the individual's experience, of the different senses, such as sight and touch.

We test the reliability of a perception through one sense by determining whether it leads to and coheres with perception through other senses. This criterion is, however, insufficient of itself. Sight and hearing, for example, may agree, but, if no other person admitted the truthfulness of my perception, I would, if sane and sober, conclude that I had been deceived.

The belief in physical reality is really, in a final analysis, belief in a public realm of experience, accessible to other percipients of like nature with one's self. This belief, therefore, rests on the recognition of a social realm of beings with the same perceptual and rational powers. I shall not here discuss the grounds that we have for believing in such a realm, since I have limited this article to the consideration of the problem of physical reality. I

may, however, point out that, both genetically and logically, the consciousness of the privacy and uniqueness of the self involves the parallel recognition of other private selves, and of the public or common features embodied in discourse and action among such selves. The very development and employment of the so-called objective physical 'constants' of measurement and enumeration, illustrates very aptly this social basis of physical cognition. The more discontinuously and inconstantly variable elements of perception are measured, by accepted convention, through reference to more continuously and constantly variable perceptions. For example, temperature sensations, which are amongst our most variable sensations in intensity, are measured by reference to a continuous movement of mercury within well-defined space-limits. The thermometer does not feel the sensations of heat and cold as we do. The spatial movements of the mercury have a psychical significance, because they are correlated roughly with discontinuous variations of heat and cold that are signs of comfort and discomfort, welfare and illfare for our sentient organisms. These correlations in experience are carried out with great elaborateness in physical science and its applications. In a last analysis they all refer back to social conventions, by which the relatively less variable is made the standard for the relatively more variable, the relatively more continuous for the relatively less continuous. There is no inherent reason why a bar of platinum at the temperature of 0° C. at the Bureau of Weights and Measures in Paris should be the absolute standard of spatial measurement. By convention it is so established. The science of nature is based on social conventions that arise from social and practical needs. The actual concrete nature is nature as perceived and thought by virtue of a common power of perception and reason in man.

J. S. Mill's definition of the object of perception or 'matter' as 'permanent possibility of sensation' might be accepted in the amended form 'permanent possibility of common or public and communicable perception.' This definition means that, with reference to any finite percipient, the physical order is a system of interrelated objects of actual and possible experience, having

the characteristics of continuous and coherent public perceivableness. And, of course, such a continuous and coherent system is also, with reference to the parts of it that are possible 'experiences,' not mere abstract logical possibility but real existence not yet concretely experienced. The problem of perceptual illusions should not be passed over. I shall indicate briefly the principles for its treatment. There are two chief classes: (1) individual illusions, and (2) general illusions. The first class obviously falls in with the several criteria of objectivity. I suffer from an individual illusion because I do not rightly apprehend my unique condition and position, as a psychophysical organism in the system of experience. Individual illusions have their determining conditions in the realm of public perceivability. If, for example, I see a striped tiger in my back yard, I may seek the verdict of my neighbors, or I may have sense enough to summon the physician at once, or I may seek to determine whether the concurrence of experiences through my other senses verifies the reality of the tiger. I determine whether it is an illusory perception by recourse to the tests of objectivity, namely, further experiences by agreement of different senses and publicity of the object of perception.

The second class of perceptual illusions may be illustrated by the straight stick which appears bent in the water, and by the perception of the sun's course in the heavens. In the case of the stick we all agree to test vision by reference to touch and pressure. We regard touch and pressure sensations as furnishing criteria superior to the other senses, because of the constant and intimate practical consequences of touch and pressure for our life-activities and purposes.¹ In the case of the sun's apparent movement, the immediate perceptual judgment involves an element of inference that falls in with our ordinary mental habits. We recognize this to be a universal illusion, because we can understand its conditions, and because, if it were not an illusion, we could not bring a large variety of other public perceptions into a coherent whole. The system of experience requires for its coherence and consistency for one and all rational minds, when

¹ I use 'practical' here to include all kinds of satisfying experiences.

the data of perception are fully before them, the illusoriness of just this perception.

In a secondary sense, theories of the physical world which are shaped in abstraction from both the qualitative discontinuities of actual experience and the organic interrelatedness of experience and experient, belong to reality, not indeed as pictures of the real things behind experience, but as instrumental devices that may lead to new experiences. In the words of Professor J. J. Thomson,¹ theories of the physical are policies, not creeds.

The basis of physical reality is not a 'pure' experience devoid of thought, but it is a perceptual experience organic to percipients and devoid of final meaning or reality, when torn from its context in the living system of experiences and experients. Perceptions and percipients are real only in organic and functional relations with one another. Remove the one and the other is gone. It is true, then, to say that perception is a function of the physical order and that percipients are parts of this order (and something more). But this truth loses its full truthfulness, if the other truth be overlooked, namely, that the physical order is a function of percipients.

Physical reality is real as a functional element in the whole organic system of experients and experiences. This system is meaningful and teleological. Its meanings and purposes must be truly embodied in the centers of experience in which it focuses. This system must be, in its integrity, active and living, since life, experience, and consciousness, are the attributes of experience in which the significance of experience is realized, the critical points or centers in which the activity and movement of reality finds itself and knows itself. It is not possible within the limits of a single article to discuss adequately and fully the relationships of Nature as a whole to mind. I have aimed, in the present article, only to show (1) that, unless we begin by recognizing that perceptual experience is real as it is experienced, we can never hope to get out of the sceptical *impasse*; and (2) that the reality of perception logically involves the thorough-going organic interdepend-

¹Quoted by E. B. Titchener, *Elementary Psychology of Feeling and Attention*, p. 385.

ence and correlation of perceptual object and percipient mind. It may not be amiss, in conclusion, to point out what are the really possible interpretations of the whole system of experience if our theory be true.

And first, in regard to the ultimate interpretation of the physical or perceptual element in experiences, there are, it seems to me, two possible alternatives between which no decision can be made short of a full consideration of the last convergent problems of metaphysics: (1) The final ground of our physical experiences may be a system of dynamic elements or active centers, not in themselves sentient or conscious, but manifesting their real being in their organic or functional relationship to centers of sentience and consciousness. In this case the elements of the physical order would not be individual psychical beings. On the other hand, however, these elements could not be conceived as devoid of experiential qualities. This is the view most in accord with common-sense dualism, but least in accord with the logical and metaphysical interest in a unified conception of the system of experience. (2) The final ground of our physical experiences may be a system or society of non-human psychical centers of activity, which by reason of the differences in the time and space relations of their psychical life, are opaque to our apprehension and appreciation. This view has the advantage of reducing our knowledge of selves and of their environing physical framework to common terms. It affords a unified conception of the whole system of experience as a living, purposive, sentient society. It has the disadvantage that it is not at all obvious why the line of distinction should seem in places so sharply drawn in experience between sentient and non-sentient nature, or why selves should seem to have only a bodily and perceived reality in common with the so-called inanimate world. Finally, whichever of the above views we adopt, the validity of the conclusion that reality is the whole organic system of experiences and experiencers is not thereby affected. The cognitive inter-relatedness of the elements of the physical order with experiencing centers implies that these are all elements in a teleological unity or organic totality of experience. And the way is open to conceive the system of experience

as having the ground of its unity in an absolute unity of experience or active consciousness. The ultimate and absolute reality may be a world socius and a world self in union.

J. A. LEIGHTON.

HOBART COLLEGE.